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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/561,546	12/19/2005	Jorge Sanchez	101153-22370	9390

7590 03/05/2008

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EXAMINER	
LEUNG, CHRISTINA Y	

ART UNIT	PAPER NUMBER
2613	

MAIL DATE	DELIVERY MODE
03/05/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/561,546	Applicant(s) SANCHEZ, JORGE	
	Examiner Christina Y. Leung	Art Unit 2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _19 December 2005_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-14_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-14_ is/are rejected.

7)☒ Claim(s) _12_ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _19 December 2005_ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _3-22-2006_.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to because Figures 5 and 7 include elements that are represented as gray boxes with illegible descriptive labels. Examiner respectfully notes that these elements should represented as white boxes so that the descriptive labels may be clearly understood.

2. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. **Claim 12** is objected to because of the following informalities:

In line 8 of claim 12, the period (".") after the word "transceiver" should be replaced by a semi-colon (";").

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. **Claims 2-8** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites "the characteristic slope of the extracted noise-level test signal" in lines 16-17 of the claim. There is insufficient antecedent basis for this limitation in the claim because the claim previously recites "determining a characteristic of the extracted noise-level test signal" in line 13 of the claim but does not previously recite a "characteristic slope."

Claims 3-8 depend on claim 2 and are therefore also indefinite for the above reason.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. **Claims 1, 2, 9, 10, and 13** are rejected under 35 U.S.C. 102(b) as being anticipated by **Link et al.** (US 5,526,164 A).

Regarding **claim 1**, Link et al. disclose a method for controlling a light emitting device during and without disrupting data transmission (Figure 3), comprising:

modulating a light emitting device (laser diode 2) with a noise-level test signal ("pulsed pilot signal" f_{PILOT} as shown in Figure 3) embedded in a data signal ("data signal" f_D) to produce a modulated signal output;

acquiring the modulated signal from the light emitting device (using photocell 3);

extracting the noise-level test signal from the acquired signal (column 6, lines 44-62);

digitally processing the extracted noise-level test signal to calculate power control adjustments (column 7, lines 60-67; column 8, lines 1-14); and

controlling output power of the light emitting device by applying the calculated power control adjustments (i.e., as voltage signals U_0 and U_{mod} and corresponding current signals I_0 and I_{mod}) to the light emitting device (column 6, lines 44-67; column 7, lines 1-47).

Regarding **claim 2**, as well as the claim may be understood with respect to 35 U.S.C. 112 discussed above, Link et al. disclose a method for controlling a laser during and without disrupting data transmission (Figure 3), comprising:

generating a noise-level test signal having a predetermined characteristic ("pulsed pilot signal" f_{PILOT} as shown in Figure 3);

generating a data signal having a predetermined characteristic ("data signal" f_D);

modulating a laser (laser diode 2) with the generated noise-level test signal and the data signal to produce a modulated output signal;

acquiring the modulated output signal device (using photocell 3);

extracting a noise-level test signal from the acquired modulated output signal;

determining an average value of the extracted noise-level test signal (column 6, lines 44-50);

determining a characteristic of the extracted noise-level test signal (column 6, lines 51-64);

calculating a bias current adjustment from the characteristic of the extracted noise-level test signal (i.e., current signal I_0 corresponding to voltage signal V_0);

calculating a modulation current adjustment from a ratio of the characteristic of the generated noise-level test signal to the characteristic of the extracted noise-level test signal (i.e., current signal I_{mod} corresponding to voltage signal V_{mod});

controlling a laser bias current by applying the calculated bias current adjustment to a laser driver (column 7, lines 43-47); and

controlling a laser modulation current by applying the calculated modulation current adjustment to the laser driver (column 7, lines 35-47).

Regarding **claim 9**, Link et al. disclose an apparatus for controlling a laser during and without disrupting data transmission (Figure 3), comprising:

a laser driver (including driver 24 and summer 27) for modulating the laser with a noise-level test signal ("pulsed pilot signal" f_{PILOT} as shown in Figure 3) embedded in a data signal ("data signal" f_D) to produce a modulated output signal from the laser;

a monitor photodiode (photocell 3) for acquiring the modulated signal from the laser (column 6, lines 44-62);

a digital signal processor (including elements such as filters 5, 6, 8, and 9 and demodulator 7) for extracting a noise-level test signal from the acquired signal and digitally

processing the extracted noise-level test signal to calculate power control adjustments (column 7, lines 60-67; column 8, lines 1-14); and

a servo (including controller 15) for controlling output power of the laser by applying the calculated power control adjustments (i.e., as voltage signals U_0 and U_{mod} and corresponding current signals I_0 and I_{mod}) to the laser driver (column 6, lines 44-67; column 7, lines 1-47).

Regarding **claim 10**, Link et al. disclose a method for controlling output power of a laser (laser diode 2) during and without disrupting data transmission (Figure 3), comprising:

embedding an original test signal (“pulsed pilot signal” f_{PILOT} as shown in Figure 3) in system noise;

modulating the original test signal and system noise;

mathematically extracting the embedded test signal from the modulated system noise (column 6, lines 44-62);

applying digital signal processing algorithms to the extracted test signal to calculate power control adjustments from differences between the original test signal and the extracted test signal (column 7, lines 60-67; column 8, lines 1-14); and

applying the calculated power control adjustments (i.e., as voltage signals U_0 and U_{mod} and corresponding current signals I_0 and I_{mod}) to the laser (column 6, lines 44-67; column 7, lines 1-47).

Regarding **claim 13**, Link et al. disclose a method for extracting a noise-level test signal from a modulated data signal during and without disrupting data transmission (Figure 3), comprising:

modulating a data signal ("data signal" f_D as shown in Figure 3) containing an original noise-level test signal ("pulsed pilot signal" f_{PILOT} as shown in Figure 3) to produce a modulated output signal;

acquiring the modulated output signal (using elements including photocell 3);

multiplying the acquired modulated output signal by a copy of the original noise-level test signal (f_{PILOT}) to shift the frequency of an acquired noise-level test signal within the acquired modulated signal (using demodulator 7; Link et al. specifically disclose that demodulator 7 comprises a multiplier element; column 6, lines 56-59) ; and

filtering the frequency shifted noise-level test signal from the acquired modulated signal (using low pass filter 8;column 6, lines 59-61).

8. **Claim 11** is rejected under 35 U.S.C. 102(b) as being anticipated by **Slawson et al.** (US 5,268,916 A).

Regarding **claim 11**, Slawson et al. disclose an apparatus for controlling a laser during and without disrupting data transmission (Figures 2a-b), comprising:

a laser driver 20 for modulating the laser 12 with data to produce a modulated output signal (column 3, lines 36-52);

a high frequency monitor photodiode 26 for acquiring the modulated output signal from the laser and following amplitudes of the modulated output signal (column 3, lines 52-58);

a digital signal processor (including peak and valley detection circuits 36a-b) for performing peak and valley detection of the followed amplitudes of the acquired output signal, and for calculating power control adjustments from the peak and valley detection (column 4, lines 1-27); and

a servo (including laser bias control 46 and laser modulation control 56) for controlling output power of the laser by applying the calculated power control adjustments to the laser driver (column 4, lines 28-57).

9. **Claim 12** is rejected under 35 U.S.C. 102(b) as being anticipated by **Levin et al.** (US 4,994,675 A).

Regarding **claim 12**, Levin et al. disclose a method for controlling a laser system during and without disrupting data transmission (Figure 3), comprising:

embedding a noise-level test signal (i.e., "XX Test Signal" as shown in Figure 3) in system noise of a data signal("A to B Information Signal") in a first laser transceiver (i.e., the "Point A" transceiver as shown in Figure 3 including transmitter 15 and receiver 33; column 6, lines 11-30; column 7, lines 24-27);

transmitting a data signal containing the noise-level test signal embedded in system noise from the first laser transceiver to a second laser transceiver using optical path (fiber optic link 17);

receiving the transmitted signal at the second laser transceiver (i.e., the "Point B" transceiver including receiver 18 and transmitter 30);

detecting, recovering and digitally processing the noise-level test signal at the second transceiver to determine characteristic information about the first laser transceiver and the optical path (using elements 19, 22, and 23; column 6, lines 36-53);

sending the characteristic information from the second laser transceiver to the first laser transceiver (using elements 25 and 26; column 6, lines 54-57; column 7, lines 38-45);

receiving the characteristic information at the first transceiver; and

adjusting the output characteristics of the first laser transceiver according to the received characteristic information (column 7, lines 24-49).

10. **Claim 14** is rejected under 35 U.S.C. 102(b) as being anticipated by **Kaaden et al.** (US 5,949,606 A).

Regarding **claim 14**, Kaaden et al. disclose a method for extracting a noise-level test signal from a modulated data signal during and without disrupting data transmission (Figure 1), comprising:

modulating a data signal containing an original sinusoidal noise-level test signal (such as pilot tone F1) to produce a modulated output signal (i.e., signal U; column 5, lines 9-18);

acquiring the modulated output signal;

splitting the acquired modulated signal into a first half and a second half (column 5, lines 34-38);

multiplying the first half of the acquired modulated output signal by a sinusoidal copy of the original sinusoidal noise-level test signal to shift the frequency of an acquired noise-level test signal within the acquired modulated signal (using mixer M10 and the sine-wave output of signal generator SG1; column 5, lines 30-41);

filtering the frequency shifted sinusoidal noise-level test signal from-the acquired modulated signal (using low pass filter LPF10; column 5, lines 41-44);

squaring the filtered sinusoidal noise-level test signal (using squarer Q10; column 5, lines 41-44);

multiplying the second half of the acquired modulated output signal by a cosinusoidal copy of the original sinusoidal noise-level test signal to produce a cosinusoidal noise-level test

signal and shift the frequency of the acquired cosinusoidal noise-level test signal within the acquired modulated signal (using mixer M11 and the cosine-wave output of signal generator SG1; column 5, lines 30-41);

filtering the frequency shifted cosinusoidal noise-level test signal from the acquired modulated signal (using low pass filter LPF11; column 5, lines 41-44);

squaring the filtered cosinusoidal noise-level test signal (using squarer Q11; column 5, lines 41-44); and

adding the squared sinusoidal and cosinusoidal acquired test signals to produce an amplitude of the acquired noise-level test signal (using adder A1; column 5, lines 48-51).

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. **Claims 3-7** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Link et al.** in view of **Walker** (US 5,889,802 A).

Regarding **claims 3-5**, Link et al. disclose a system as discussed above with regard to claim 2, including a noise-level test signal, but they do not specifically disclose that the test signal is a sinusoidal, saw tooth, or composite signal.

However, various signal shapes are well known in the communications art. In particular, Walker teach a system that is related to the one disclosed by Link et al., including using a noise-

level test signal to control a laser (Figure 6; column 8, lines 28-31). Walker further teaches that the test signal may be a sinusoidal, saw tooth, or composite signal (column 9, lines 1-44).

Regarding claims 3-5, it would have been obvious to a person of ordinary skill in the art to use a sinusoidal, a saw tooth, or a composite signal as taught by Walker in the system disclosed by Link et al. as an engineering design choice of an effective signal shape for implementing the already-disclosed noise-level test signal. The claimed differences exist not as a result of an attempt by Applicants to solve an unknown problem but merely amount to the selection of expedients known as design choices to one of ordinary skill in the art.

Regarding **claims 6 and 7**, Link et al. disclose a system as discussed above with regard to claim 2 including a noise-level test signal, and further disclose that the test signal is extracted by applying digital signal processing (using microcontroller 13) and filtering to the acquired modulated output signal. Link et al. do not specifically disclose that the digital signal processing includes a lock in detector or a quadrature detector algorithm.

However, various signal detection algorithms are known in the communications art, and Walker further teaches using lock in detection (column 8, lines 50-53) and quadrature detection (Figure 8). Regarding claims 6 and 7, it would have been obvious to a person of ordinary skill in the art to use either lock in detection or quadrature detection as taught by Walker in the system disclosed by Link et al. as an engineering design choice of a way to effectively detect and recover information from the signal. Again, the claimed differences exist not as a result of an attempt by Applicants to solve an unknown problem but merely amount to the selection of expedients known as design choices to one of ordinary skill in the art.

13. **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Link et al.** in view of **King et al.** (US 5,812,572 A).

Regarding **claim 8**, Link et al. disclose a system as discussed above with regard to claim 2 including a noise-level test signal, and further disclose that the test signal is extracted by applying digital signal processing (using microcontroller 13) and filtering to the acquired modulated output signal. Link et al. do not specifically disclose that the digital signal processing includes a regression detector algorithm.

However, various signal detection algorithms are known in the communications art. In particular, King et al. teach a system that is related to the one disclosed by Link et al., including using feedback information to control a laser (Figure 1) and further teach using a regression detector algorithm (column 12, lines 9-27).

Regarding claim 8, it would have been obvious to a person of ordinary skill in the art to use a regression detection algorithm as taught by King et al. in the system disclosed by Link et al. as an engineering design choice of a way to effectively detect and recover information from the signal. Again, the claimed differences exist not as a result of an attempt by Applicants to solve an unknown problem but merely amount to the selection of expedients known as design choices to one of ordinary skill in the art.

Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christina Y. Leung whose telephone number is 571-272-3023. The examiner can normally be reached on Monday to Friday, 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached on 571-272-3022. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Christina Y. Leung/

Primary Examiner, Art Unit 2613